ticulars of the lectures can be obtained from the secretary of University College.

THE annual prize distribution and conversazione of the Northampton Polytechnic Institute, Clerkenwell, E.C., will be held on Friday and Saturday, February 5 and 6. The Earl of Halsbury, P.C., will distribute the prizes on February 5, and after the prize distribution the new buildings, which have been recently erected in the courtyard with funds provided by the London County Council, will be formally declared open. After the above ceremonies the whole of the laboratories, workshops, drawing offices, and studios of the institute will be on view in working order.

THE second international course for legal psychology and psychiatry will be held at Giessen (Grandduchy of Hesse), Germany, on April 13—18. The course will be under the direction of Prof. Sommer, with the cooperation of Profs. Mittermaier and Dannemann, of Giessen, and Prof. Aschaffenburg, of Cologne. All communications should be addressed to Dr. Sommer, professor of psychiatry, University of Giessen.

AN article by Prof. Fleming in *Engineering* for January 8 directs attention to the need for a revision of the syllabus for the B.Sc. degree in engineering at London University. It is contended that the syllabus now in force enables a candidate to obtain the degree without having undergone a systematic training in civil, mechanical, or electrical engineering, owing to the freedom of choice allowed, especially in the second or "B" group of subjects. The experience of several years has shown that a large number of candidates exercise their freedom of choice by taking the path of least resistance, and they do not, as a rule, select subjects which form complete and well-arranged courses of study. Subjects of minor importance have, to the majority of candidates, a wide popularity for examination purposes, and Prof. Fleming suggests that if university degrees are to possess, or to continue to possess, any importance in the engineering world, the courses of study must be framed solely with a view to equip students for their work in after life, and not for the immediate purpose of passing an examination.

WE have received a copy of the second series of papers published by the Department of Education of the Armstrong College, Newcastle-upon-Tyne. The special feature of the pamphlet is a very full account of an experiment of a novel character in training-college practice. As Prof. Mark R. Wright, the head of the department, points out, in ordinary school work there is a tendency for the relations between teachers and taught to become formal and artificial, and the motive of the experiment described in these pages was to determine how far a training-college camp could be made to obviate such tendency and to import humanising influences and greater cordiality into the work of education. Outdoor life and the study of nature under skilled guidance were among the distinguishing characteristics of the fortnight's life under canvas, and the results of the experiment appear to have been gratifying. The experiment is, we understand, to be repeated annually, and we hope it may be imitated by other training-college authorities. There can be no doubt that intelligent, well-planned experiments, followed by an impartial and correct account of the results obtained, will contribute more than any other expedient to the development and formulation of a science of education. These "papers" may be commended to the attention of students of educational problems.

THE report on the operations of the University of the Punjab for the year ending September 30, 1908, emphasises the contention, says the *Pioneer Mail*, that in Indian universities the arts side, which comprises exclusively literary courses, is patronised to the neglect of the scientific side of education. In the Punjab University there is no faculty either of engineering or of commerce. There is a faculty of science, but its examinations, compared with those of the faculty of arts, do not attract many candidates. Referring to the examinations of the two faculties held in 1908, it is pointed out by our contemporary that in the matriculation examination, whilst in the arts faculty there were 3408 candidates, of whom 1470 were successful, in the science faculty there were only 72, of whom 36 were successful. In the intermediate examination, whilst 697, of whom 308 were successful, appeared on the arts side, the number of those who appeared on the science side did not exceed 39, and of these 18 were successful. Whilst 315 appeared for the degree of Bachelor of Arts and 116 were successful, a much smaller number, of whom 5 were successful, competed for the degree of Bachelor of Science. As regards the master's degree in the two faculties, whilst 42 competed on the arts side, there were only 4 on the science side. The results on the science side were, however, better than those on the arts side.

## SOCIETIES AND ACADEMIES.

### LONDON.

**Royal Society**, Received November 3, 1908.—"Reciprocal Innervation of Antagonistic Muscles. Thirteenth Note. The Antagonism between Reflex Inhibition and Reflex Excitation." By Prof. C. S. **Sherrington**, F.R.S.

In this paper the question is raised as to how reflex excitation and reflex inhibition are related one to another in their action on a reflex centre common to both of them. In the case of such antagonisms as the action of the vagus and accelerans on the heart and that of the vasodilatator and vasoconstrictor nerves on a vascular area, and that of depressor and excitatory asphyxial influences on the vasomotor centre, several observers have shown that the antagonism is a pseudo-antagonism rather than a real antagonism—that is, the one action interferes with the other by delaying it, but does not directly annul it or really abolish or counterbalance it.

The present paper brings experimental evidence that in reflex inhibition and reflex excitation playing upon a common centre we have two influences which are really in the strict sense antagonistic in that they behave one to another as two forces which act in opposite direction at the same point of application. The result is an algebraic summation of the effects obtainable from the two nerves—the excitatory afferent and the inhibitory afferent—singly. The individual effects of the two nerves fuse to a resultant. The two opposed nerves must have in the reflex centre a common locus of operation. There the antagonistic influences collide. This point of collision may lie at a synapse, in which case the opposed influences may be thought of as altering oppositely the permeability of the synaptic membrane. Or it may lie in the substance of a neurone, if so, probably in the motoneurone itself, and in that part of it which lies within the reflex centre. In either case the net change which results when the inhibitory and excitatory afferents are concurrently stimulated is an algebraic sum of the *plus* and *minus* effects producible by the two antagonistic nerves singly. Tracings illustrate the experimental results.

November 19, 1908.—"Measurement of Rotatory Dispersive Power in the Visible and Ultra-violet Regions of the Spectrum." By Dr. T. Martin **Lowry**.

In order to measure rotatory dispersive power in the visible region of the spectrum, the light from an arc formed between a pair of rotating metallic electrodes is concentrated by a lens on the widely opened slit of a constant-deviation spectroscope. An achromatic lens of 22-inch focus (displacing the telescope of the instrument) casts a magnified image of the slit on the polarising prisms of a triple-field polarimeter. The colour of the image can be varied by rotating the prism of the spectroscope; its maximum width for monochromatic illumination is determined by the openness of the spectrum and the efficiency of the dispersive system. Of the twenty-six wave-lengths employed, those shown in heavy type can be read with the full width of the aperture, the remainder as bands occupying one-third of its width; the yellow mercury doublet can be read as a single band or as two narrow separate lines :—

| | | | | | |
|---|---|---|---|---|---|
| Li | **6708** | Na | **5893** | Tl | **5351** (flame spectra) |
| Hg | *5790* | *5769* | **5461** | **4359** | (enclosed arc) |
| Cd | **6438** | **5086** | **4800** | **4678** | |
| Cu | 5782 | 5700 | 5219 | 5154 | 5105 |
| | 4705 | 4651 | 4587 | 4378 | |
| Zn | **6364** | 4811 | 4722 | 4680 | |
| Ag | **5469** | **5209** | | | |

A photographic method is also described which can be used throughout the visible and ultra-violet regions of the spectrum.

December 10, 1908.—"Results of Magnetic Observations at Stations on the Coasts of the British Isles, 1907." By Commander L. **Chetwynd,** R.N. Communicated by Rear-Admiral A. M. Field, R.N., F.R.S.

With a view to compare the values of secular change of declination, horizontal force, and inclination, at various stations on the coasts of the British Isles, with the values derived from the continuous records at Kew Observatory, observations have been made at certain stations selected from those occupied by Rücker and Thorpe during their magnetic survey for the epoch January 1, 1891.

The observers detailed to make the observations were Captain M. H. Smyth, R.N., H.M.S. *Research*; Captain W. Pudsey-Dawson, R.N., H.M.S. *Triton*; and Captain J. W. Combe, R.N., H.M. surveying vessel *Gladiator*. The stations selected were fairly distributed around the coasts, so that a mean of the results would represent the mean for the whole area embraced.

The observations have been reduced to the epoch January 1, 1907, by means of comparisons with the records at Kew Observatory. The resulting values of mean annual changes for the British Isles are as follows:—

| | *a* 21-year period, 1886–1907 | *b* 16-year period 1891–1907 |
|---|---|---|
| (1) Declination... ... ... .. | − 5′·7 | − 5′·1 |
| (2) Horizontal force... ... ... | + 19 γ | + 18 γ |
| (3) Inclination ... ... ... ... | − 1′·6 | − 1′·4 |
| (4) Vertical force (excepting the results at Dublin and Tanera Mor) ... ... ... | — | − 14 γ |

The mean annual changes of declination at Kew comparable with (1) *a* and *b* are respectively 5′·2 and 4′·9. Thus the mean for the British Isles during the 16-year period is 0′·2 greater than at Kew.

The mean horizontal force change appears to have been 3 γ less than at Kew. The mean inclination change during the 21-year period was 0′·1 less, and during the 16-year period 0′·6 less, than at Kew.

The mean vertical force change during the 16-year period has been 8 γ less than at Kew.

Diagrams showing the mean annual changes at Kew from 1889 to 1904 indicate that the declination change, which since 1894 has been decreasing in amount, is now increasing, and that the probable value at Kew for January 1, 1907, is 4′·8. For the whole of the British Isles, therefore, the mean value is assumed to be 5′.

The annual increase of horizontal force continues to diminish, and is at the present time very small; there has been a very marked diminution during the last two years, and the annual increase may shortly become a decrease.

The annual change of inclination continues to decrease in amount, and is now 1′ (nearly).

A comparison of the value of the mean annual change of declination at Kew, Greenwich, and Stonyhurst shows that during the period embracing Rücker and Thorpe's survey (1886–94) the change at Stonyhurst was considerably greater than at Kew and Greenwich, this being in accord with the results found by Rücker and Thorpe (that the secular change was greater in the north-west than at Kew).

Since the year 1894, however, the values have been in closer agreement, that at Stonyhurst being slightly less than at Kew. Thus it is indicated that the variations of secular change are not, over the area referred to, synchronous.

Comparisons of results of declination observations made at sea with those made on shore show considerable differences, and although the sea observations cannot be considered to the same degree of accuracy as the shore observations, the differences are in most cases outside the margin which might be assigned to this cause.

The results indicate that the values at sea are, off the east coast generally greater, and on the west coast generally less, than the corresponding values adduced from observations made on shore. It is intended to investigate this subject further.

**Royal Meteorological Society,** January 20.—Annual meeting.—Dr. H. R. Mill, president, in the chair.—Presidential address, Some aims and efforts of the society in its relation to the public and to meteorological science: Dr. **Mill.** In dealing with the subject-matter of meteorology, as of other sciences, there are two extreme points of view which appeal to opposite types of mind; these are the simply observational and the purely analytical, and it is one of the great advantages of a scientific society to bring representatives of the two types together, and to encourage mutual toleration and understanding. After referring to the activity of the society in the establishment of well-equipped and carefully inspected stations for accurate observations of meteorological phenomena, and to the work carried out by various special committees, the president proceeded to direct attention to two lines of usefulness open to the society at the present time. One is the correction of the impulsive sensationalism and anti-scientific spirit in meteorological matters of a certain section of the Press in this country, which no doubt faithfully reflects the somewhat muddled ideas of the careless public; of these he gave some striking instances. The other is the advance which has been made in meteorological science during the last few years, and the new opportunities it brings. He alluded to the popular errors which are current concerning published weather records, and the prejudicial effect of these on the meteorological departments maintained by many municipalities. He had heard of instances of reports being suppressed in order to "obviate misconceptions," and of instruments being moved in order to obtain more agreeable records. He deprecated the keenness of rivalry between health resorts claiming low rainfall, high sunshine, and small range of temperature, and pointed out that modern bacteriology had shown that dust, not rain, was the chief menace to public health. He went on to say that we now stand at an important point in the history of meteorology, which bids fair to expand in interest and importance in the twentieth century as chemistry did in the nineteenth, and from the same cause, the increasing necessity of applying its principles to practical ends. The point of view of the meteorologist to-day is different from that of fifty or even of twenty years ago. Then the only department in which much general interest could be expected was climatology—the study of the average conditions of the atmosphere at different places. Much remains to be done in that direction; but the main interest is being diverted from the study of the air 4 feet above the ground, on the study of which climatology has been based, to the vast expanse of the upper atmosphere miles above the abode of man. He believed that in a few years the practical needs of aviation will demand a far more exact knowledge than is now required of atmospheric circulation, of the relation of wind to gradient, of the disturbing influence of insolation on pressure, and especially of the nature and movements of cyclones and squalls, and these things becoming of practical importance, it will become worth while commercially to find the means for studying them. The position of meteorology now is not unlike that of oceanography before the necessity of laying cables led to the exact study of ocean depths, and it is to be expected that the flying machine will do for the study of the air what the cables did for the study of the sea.

**Entomological Society,** January 20.—Mr. C. O. Waterhouse, president, in the chair.—Presidential address, The claws of insects: C. O. **Waterhouse.** After briefly describing the various forms of insects' claws, which are classified as toothed, appendiculate, bifid, or pectinate, and having given examples of each, the president suggested as a subject for investigation, which he hoped entomologists would take up as a study, "Are these forms of claw merely the result of heredity without any special object, or is there evidence to show that the different forms are adapted to particular modes of life, in fact, have been developed to meet special needs?" He then proceeded to show by numerous examples that closely allied species often had dissimilar claws, that insects with quite different habits had the same form of claw, and that others with different forms of claw seemed to have the same habits. The question, therefore, appeared to be still an open one requiring careful investigation.

DUBLIN.

**Royal Dublin Society**, December 22, 1908.—Prof. A. F. Dixon in the chair.—The production of ammonia from atmospheric nitrogen by means of peat: Dr. H. C. **Woltereck.** The author showed that by the various processes known only about one-third of the nitrogen contained in the peat can be recovered. The evolution of the synthesis from the use of hydrogen and nitrogen with reduced iron, down to coke and peat, with air and steam was described, and the analogy of this process with that using iron was definitely proved by the use of sugar carbon, free from nitrogen, thus demonstrating the indisputable cooperation of atmospheric nitrogen.—The pollination of certain species of Dendrobium: Dr. A. F. G. **Kerr.** An arrangement often found in the flowers of the section Eu-dendrobium is described, whereby the elasticity of the filament causes the anther to be jerked down and to block the passage past the stigma to the nectary as the visiting insect withdraws from the flower. By this mechanism only the first visitor can pollinate the stigma. The pollinia are only discharged as the visitor leaves, consequently it is evident that cross-pollination only can occur. The mechanism is quite different from that described by Darwin in *D. chrysanthum*, which, he believed, aided self-pollination. Experiments on many specimens of sixteen species of Eu-dendrobium in their native habitats showed that self-pollination was effective in only 8 per cent., and cross-pollination in 100 per cent. Modifications of the mechanism described allowing self-pollination are found in the species which contribute this 8 per cent. The paper also contains descriptions of arrangements obtaining in other Dendrobia which favour or oppose self-pollination, as well as records of experiments on these species of self- and cross-pollination. All the observations were carried out in the natural localities.—The absorption of water by seeds: W. R. G. **Atkins.** An examination of the behaviour of seeds of *Phaseolus vulgaris* and *Lathyrus odoratus*, both living and dead, in water and salt solutions, shows that no semi-permeable membrane exists in them until after germination, when the protoplasm of the cells acts as such. The evolution of $CO_2$ may be detected within two hours after moistening air-dried seeds, whether they are living or killed by chloroform.

PARIS.

**Academy of Sciences**, January 18.—M. Bouchard in the chair.—Some applications of the method of M. Fredholm: H. **Poincaré.**—A general method of preparation of the trialkylacetic acids: A. **Haller** and Ed. **Bauer.** Ketones of the type $C_6H_5.CO.C.R_1R_2R_3$ were dissolved in benzene and heated with sodium amide, and split up quantitatively into benzene and the amide of the trialkylacetic acid,

$$(R_1R_2R_3)C.CO.NH_2;$$

the latter, treated with nitrosyl sulphate, gives the corresponding acid, $C(R_1R_2R_3).CO.OH$. The method is general, and has been applied to the preparation of pivalic, dimethylethylacetic, dimethylpropylacetic, methyldiethylacetic, triethylacetic, and methylethylpropyl acetic acids, as well as the corresponding amides. The distinguishing physical properties of these compounds are given.—A hæmogregarian of *Tupinambis teguixin*: A. **Laveran** and M. **Salimbeni.** This organism appears to constitute a new species, for which the name *H. tupinambis* is proposed. The paper is accompanied by six diagrams showing various stages of development.—An epithelium with striated muscular fibres: F. **Henneguy.** A demonstration of the existence of striated muscular fibrillæ in the walls of the epithelial cells of the digestive tubes of *Alcyonidium hirsutum* and *Bugula alveolata*.—An apparatus for recording the absolute acceleration of seismic movements: G. **Lippmann.**—The evolution of the Tertiary mammals: the importance of migrations. The Pliocene epoch: Charles **Depéret.**—M. W. Kilian was elected a correspondant in the section of mineralogy in the place of the late M. Peron.—Discussion of the micrometric measurements made at the Observatory of Lyons during the eclipse of June 28, 1908: F. **Merlin.**—A zenithal photographic telescope: A. de la Baume **Pluvinel.** The instrument is designed to determine the astronomical coordinates of the place where it is set up. The latitude is deduced from the zenithal distance of a star measured on a negative, the longitude from a knowledge of the time at which the star occupies, on the negative, a certain position corresponding to the passage through the meridian.—A problem concerning geodesic lines: Jules **Drach.**—A generalisation of a theorem of Jacobi: W. **Stekloff.**—The theory of continuous functions: Maurice **Fréchet.**—Differential equations the general integral of which is uniform: J. **Chazy.**—Some optical and magneto-optical phenomena in crystals at low temperatures: Jean **Becquerel.** A discussion of the causes of the differences between the conclusions of the author and those of MM. H. du Bois and Elias.—A characteristic property of a hexagonal network of small magnets: L. **de la Rive** and Ch. Eug. **Guye.**—An optical arrangement for varying the lighting of a surface according to a law determined in advance: Th. **Guilloz.**—The rapid preparation of calcium phosphide for making hydrogen phosphide: C. **Matignon** and R. **Trannoy.** Dried calcium phosphate is heated with aluminium powder, and the mixture started off at a dull red heat. The product is a mixture of calcium phosphide and alumina, which on treatment with water gives a nearly pure non-inflammable phosphoretted hydrogen. The only impurity of the gas obtained in this way is hydrogen, which may be present up to 3 per cent.—The action of sulphur chloride, $S_2Cl_2$, on the metallic oxides: F. **Bourion.** It has been found that in certain cases in which the method of treating the oxide with chlorine and sulphur chloride fails, the latter alone gives a good yield of the anhydrous chloride. Amongst other chlorides prepared in this way, that of samarium is noteworthy, as of all the oxides of the cerium group this is the most difficult to transform into chloride.—Colour reactions of dioxyacetone: G. **Denigès.**—The nature of the bromacetamide of Hofmann: Maurice **François.** This bromine derivative can be prepared by the evaporation of a mixture of hypobromous acid and acetamide. On this account the author considers its composition to be $CH_3.CO.NH_2.Br.OH$.—Researches on the products of saponification of dioxalsuccinic ester. Isopyromucic acid: E. E. **Blaise** and H. **Gault.**—The preparation of aldehydes and anhydrides of acids: A. **Béhal.** Benzylidene chloride, heated with acetic acid, reacts according to the equation

$$C_6H_5.CHCl_2 + 2CH_3.CO_2H = 2HCl + C_6H_5CH{:}O + (CH_3CO)_2O.$$

The presence of certain salts, such as chloride of cobalt, assists the reaction.—The artificial oxydases and peroxydases: M. **Martinand.**—The successive induction of coloured images after a very strong stimulation of the retina, and the classic theories of vision: Romuald **Minkiewicz.**—X-rays of high penetration obtained by filtration. Their advantage in radio-therapy for the treatment of deep-seated tumours: H. **Guilleminot.** The filtration of the rays through 5 mm. of aluminium is recommended; the issuing rays will be approximately "monochromatic." Although the absolute quantity transmitted will be much reduced, necessitating a longer exposure, the percentage absorption in the soft tissues will be small, and deep-seated tumours can be more effectively reached by the rays.—The identification of revolver bullets: V. **Balthazard.** The problem was to prove whether certain bullets found on the floor had traversed the arm of the wounded person. It is shown that after traversing a cloth material, characteristic markings are produced on the leaden bullet, and these are not obliterated by the subsequent passage through flesh, provided a bone is not encountered. It is even possible to identify the nature of the garment through which the bullet has passed by a careful examination of the markings on the bullet.—Sexual reproduction in the Actinocephalids: P. **Léger** and O. **Duboscq.**—Some Sertulariidæ in the British Museum collection: Armand **Billard.**—Biological researches on the conditions of viviparity and larval life of *Glossina palpalis*: E. **Roubaud.**—New observations on the habits of the asparagus fly (*Platyparea poecilоptera*) in the neighbourhood of Paris. The insufficiency of the method of destruction now in use: P. **Lesne.**—A possible interpretation of the waves of the principal phase of seismograms: M. de Montessus **de Ballore.**—The earthquake of December 28, 1908, recorded at the Fabra Observatory, Barcelona: J. Comas **Sola.**

NEW SOUTH WALES.

**Linnean Society**, November 25, 1908.—Mr. Henry Deane, vice-president, in the chair.—The *rôle* of nitrogen and its compounds in plant-metabolism, part i., historical: Dr. J. M. **Petrie.** A summary of the recent advances made in the study of proteins and their antecedents in the plant. An account is given of the nitrogen compounds which occur in seeds, and the modern views of their function in germination.—The *rôle* of nitrogen and its compounds in plant-metabolism, part ii.: Dr. J. M. **Petrie.** Deals with the non-protein nitrogen compounds of seeds, and gives the results obtained from the analyses of the seeds of thirty different plants. Previous investigators have seldom found less than 90 per cent. of the total nitrogen existing as protein, whereas the author finds as much as 45 per cent. of non-protein nitrogen compounds in ripe Acacia seeds. Exact descriptions of the methods employed are also given.—Contribution to a knowledge of Australian Hirudinea, part ii.: E. J. **Goddard.** A new genus is proposed for a leech from a fresh-water pool at Oberon, New South Wales.—Contribution to a knowledge of Australian Oligochæta, part ii.: E. J. **Goddard.** Another phreodrilid worm, from pools on the Mt. Wellington plateau, Tasmania, is described. It is of interest because its Tasmanian habitat completes the circuit of distribution of the family—from South America to New South Wales.—Illustrations of polycotyledony in the genus Persoonia (N.O. Proteaceæ): J. J. **Fletcher.** In 1882, as the result of his examination of the fruits of twenty-three out of a total of sixty-one described species of Persoonia, the late Baron von Mueller was able to announce that the embryos of nineteen of them were polycotyledonous. The object of the present paper is to supplement the Baron's observations in so far as these relate to the species of Persoonia to be found in the neighbourhood of Sydney and on the Blue Mountains, from a study of seedlings, and whenever it was possible of a considerable number of them. The cotyledons of about 700 seedlings, representing ten species, four of which are not in the Baron's list, and, in addition, the embryos of two species of which seedlings were not procurable, one of which is not in the Baron's list, were examined. The only seedlings or embryos with two cotyledons met with were those of *P. ferruginea*, Sm. Not only is the number of cotyledons in all the other species examined inconstant, but about 10 per cent. of the total number of seedlings were found to possess one, occasionally two, or rarely three notched, bifid, or bipartite cotyledonary members; some of these possibly may have been cases of connate cotyledons.

## DIARY OF SOCIETIES.

*THURSDAY*, JANUARY 28.

ROYAL SOCIETY, at 4.30.—The Action of the Venom of *Sepedon haemachates* of South Africa: Sir Thomas R. Fraser, F.R.S., and Dr. J. A. Gunn.—The Colours and Pigments of Flowers with Special Reference to Genetics: Miss M. Wheldale.—The Variations in the Pressure and Composition of the Blood in Cholera; and their Bearing on the Success of Hypertonic Saline Transfusion in its Treatment: Prof. Leonard Rogers, I.M.S.—The British Freshwater Phytoplankton, with Special Reference to the Desmid-plankton and the Distribution of British Desmids: W. West and G. S. West.—The Selective Permeability of the Coverings of the Seeds of *Hordeum vulgare*: Prof. Adrian J. Brown.—The Origin of Osmotic Effects. II. Differential Septa: Prof. H. E. Armstrong, F.R.S.

ROYAL INSTITUTION, at 3.—Mysteries of Metals: Prof. J. O. Arnold.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—The Parallel Operation of Alternators: Dr. E. Rosenberg.

ROYAL SOCIETY OF ARTS, at 4.30.—Some Phases of Hinduism: Krishna Gobinda Gupta.

*FRIDAY*, JANUARY 29.

ROYAL INSTITUTION, at 9.—Improvements in Production and Application of Gun-cotton and Nitro-glycerine: Sir Frederick L. Nathan.

*SATURDAY*, JANUARY 30.

ROYAL INSTITUTION, at 3.—Sight and Seeing: Sir Hubert von Herkomer.

ESSEX FIELD CLUB, at 6 (at Essex Museum of Natural History, Romford Road, Stratford).—Subsidence of Eastern England and Adjacent Areas: W. H. Dalton.—Some Notes on "Moorlog," a Peaty Deposit dredged up in the North Sea: H. Whitehead and H. H. Goodchild.

*MONDAY*, FEBRUARY 1.

ROYAL SOCIETY OF ARTS, at 8.—Electric Power Supply: G. L. Addenbrooke.

SOCIETY OF CHEMICAL INDUSTRY, at 8.—The Manufacture of Nitro-cellulose: Sir Frederick Nathan.

*TUESDAY*, FEBRUARY 2.

ROYAL INSTITUTION, at 3.—The Architectural and Sculptural Antiquities of India: Prof. A. A. Macdonell.

ZOOLOGICAL SOCIETY, at 8.30.—Notes on the Fauna of Christmas Island: Dr. C. W. Andrews, F.R.S.—Report on the Pathological Observations at the Society's Gardens during 1908: Dr. H. G. Plimmer.—Preliminary Account of the Life-history of the Leaf-insect, *Phyllium crurifolium*, Serv.: H. S. Leigh.—The Mammals of Matabeleland: E. C. Chubb.

ROYAL SOCIETY OF ARTS, at 4.30.—The Production of Wheat in the British Empire: Albert E. Humphries.

INSTITUTION OF CIVIL ENGINEERS, at 8.—On Heat-flow and Temperature-distribution in the Gas-engine: Prof. B. Hopkinson.

*WEDNESDAY*, FEBRUARY 3.

SOCIETY OF PUBLIC ANALYSTS, at 8.—The use of Quartz Combustion Tubes especially for the Direct Determination of Carbon in Steel: B. Blount and A. G. Levy.—The Composition and Analysis of Chocolate: P. A. Ellis Richards, C. H. Cribb, and N. P. Booth.—Note on some Commercial Samples of Monobrombenzene: J. H. Coste.

ENTOMOLOGICAL SOCIETY, at 8.

*THURSDAY*, FEBRUARY 4.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: On the Electricity of Rain and its Origin in Thunderstorms: Dr. George C. Simpson.—The Effect of Pressure upon Arc Spectra, No. 3, Silver. $\lambda$ 4000–$\lambda$ 4600: W. G. Duffield.—The Tension of Metallic Films deposited by Electrolysis: G. Gerald Stoney.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY, at 8.—The Stability of Arches: Prof. Henry Adams.

LINNEAN SOCIETY, at 8.—On *Fucus spiralis*, Linn.: Dr. F. Börgesen.—Economy of *Ichneumon manifestator*, Linn.: C. Morley.—On the Polyzoa of Madeira: Rev. Canon Norman, F.R.S.

RÖNTGEN SOCIETY, at 8.15.—The Transport of Ions: Dr. Howard Pirie.

*FRIDAY*, FEBRUARY 5.

ROYAL INSTITUTION, at 9.—The Influence of Superstition on the Growth of Institutions: Prof. J. G. Frazer.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Design and Construction of Docks: Sir Whately Eliot.

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